

## REMARKS

### Introduction

In response to the Office Action dated May 8, 2007, Applicants have amended claims 11-21. Claims 22 and 23 have been cancelled. Claim 25 has been added. Care has been taken to avoid the introduction of new matter. Claim 24 is withdrawn. In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

Applicants acknowledge the Interview Summary dated June 1, 2007. The Examiner confirmed that the shortened statutory period for the non-final Office Action was set at three months rather than the one month.

### Drawings

The drawings are objected to under 37 C.F.R. 1.83(a). The Office Action asserts that the *appliances* of claim 15 must be shown or the features canceled from the claim. This objection is traversed.

Amended claim 15 recites, in part, "...inserting protruding portions of a boring appliance."

Fig. 11 clearly shows a boring appliance 40c. Further, as acknowledged by the Examiner, only a single appliance is shown in the drawings.

Withdrawal of the objection to the drawings is, therefore, respectfully solicited.

**Claim Rejection Under 35 U.S.C. § 101**

Claims 11-21 stand rejected under 35 U.S.C. § 101 because the claimed invention is purportedly directed to non-statutory subject matter. The Office Action asserts that claim 11 requires both apparatus and method steps, for example, claim 11 has a drawing step, which comprises structural language, *e.g.*, “means.”

Applicants respectfully submit that the rejection is moot in view of the amendment to claims 11-14 and 16-20, which deleted the “means” language identified by the Examiner.

As described in the claimed subject matter per amended claim 11, the drawing step includes obtaining an area fraction of the plurality of voids in the drawn optical fiber, and performing feedback control of pressure in the plurality of voids based on the obtained area fraction. Support for amended claim 11 is found in, for example, pg. 15, lines 1-13; pg. 15, line 23 – pg. 24, line 11 of the originally filed specification.

As described in the claimed subject matter per amended claim 16, the drawing step includes a holding condition that varies at least a temperature of a drawing furnace for heating the preform or a time length for the optical fiber to pass the drawing furnace. Support for amended claim 16 is found in, for example, pg. 16, line 20 – pg. 17, line 20.

It is respectfully submitted that claims 11-21 are directed to a method of making an optical fiber, which comport with the requirements of 35 U.S.C. § 101.

**Claim Rejections Under 35 U.S.C. § 112**

Claims 11-21 stand rejected under 35 U.S.C. § 112, second paragraph, as purportedly being indefinite for failing to particularly point out and distinctly claim the subject matter, which the Applicants regards as the invention.

The Office Action states that the claims are hybrid claims and are therefore indefinite as to what they require. This rejection is traversed.

The Office Action has failed to provide any basis for asserting that the claims are hybrid claims and are therefore indefinite. As stated above, the amendment to claims 11-14 and 16-20 deleted the “means” language identified by the Examiner.

Firstly, indefiniteness under the second paragraph of 35 U.S.C. § 112 is a **question of law**, not a litmus test. *Personalized Media Communications LLC v. U.S. International Trade Commission*, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998); *Tillotson, Ltd v. Wlaboro Corp.*, 831 F.2d 1033, 4 USPQ2d 1450 (Fed. Cir. 1987); *Orthokinetics Inc. v. Safety Travel Chairs Inc.*, 806 F.2d 1565, 1 USPQ2d 1081 (Fed. Cir. 1986). In rejecting a claim under the second paragraph of 35 U.S.C. § 112, the Examiner must provide a basis in fact and/or cogent technical reasoning to support the ultimate legal conclusion that one having ordinary skill in the art, with the supporting specification in hand, would not be able to reasonably ascertain the scope of protection defined by a claim. *In re Okuzawa*, 537 F.2d 545, 190 USPQ 464 (CCPA 1976). Significantly, consistent judicial precedents hold that **reasonable precision** in light of the **particular subject matter involved** is all that is required by the second paragraph of 35 U.S.C. § 112. *Zoltek Corp. v. United States*, 48 Fed. Cl. 240, 57 USPQ2d 1257 (Fed. Cir. 2000); *Miles Laboratories, Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993); *North American Vaccine, Inc., v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPA2d 1333 (Fed. Cir. 1993); *U.S. v. Teletronics Inc.*, 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ (Fed. Cir. 1986). Applicants stress that claims must be interpreted as one having ordinary skill in the art would have interpreted the

claims in light of and consistent with the written description of the specification. *Zoltek Corp. v. United States, supra*; *Miles Laboratories, Inc. v. Shandon, Inc., supra*.

Moreover, as the Examiner should be aware, claims are indefinite only if reasonable efforts at claim construction prove futile, i.e., a claim is indefinite if it is insolubly ambiguous and no narrowing construction can properly be adopted regardless of how formidable a task it is to understand the claim. In *Vitrigen Corp. v. Biocrest Manufacturing, LP.*, 424 F.3d 1374, 76 USPQ2d 1741 (Fed. Cir. 2005). Rather, Applicants submit that one having ordinary skill in the art would have no difficulty understanding the scope of claims 11-21, particularly when reasonably interpreted in light of and consistent with the written description of the specification which is the judicial standard. *Miles Laboratories, Inc. v. Shandon, Inc., supra*.

In applying the above legal tenets to the exigencies of the case, Applicants submit that the Examiner did not discharge the initial burden of establishing a prima facie basis to deny patentability to the claimed invention under the second paragraph of 35 U.S.C. § 112.

Secondly, it is inconceivable that one having ordinary skill in the art would not have been able to ascertain the scope of the claimed invention when reasonably interpreted in light of and consistent with the written description of the specification, which is a judicial standard. *Miles Laboratories, Inc. v. Shandon, Inc., supra*.

The Office Action also asserts that the claims invoke 35 U.S.C. § 112, sixth paragraph. Applicants respectfully submit that the rejection is moot in view of the amendment to claims 11-14 and 16-20, which deleted the “means” language identified by the Examiner.

The Office Action asserts that the phrases “the preform,” “its axis,” and “the area fraction” lack antecedent basis in claim 11. In claim 11, “the preform” has been amended to --a preform--, “its axis” to --the preform axis--, and “the area fraction” to --an area fraction--.

The Office Action states that the claims refer to measuring, but the disclosure indicates that the values are not actually measured, rather, the values are calculated. The Examiner fails to point out which occurrence of “measuring” he is referring to. Amended claim 11 recites, for example, “...**obtaining** an area fraction of the plurality of voids.” Support for amended claim 11 is found in, for example, pg. 15, line 26 – pg. 16, line 8. The present application states on pg. 40, line 19-pg. 20, line 11:

In operation, by obtaining the area fraction of the voids in the optical fiber 10 from measurement during fiber drawing and then by performing the feedback control of the pressure in the voids 13, the furnace temperature and the time for the fiber to pass the fiber drawing furnace 60 using the controller 65 based on the obtained area fraction of the voids, the optical fiber 10 having the desired distribution of the area fraction of the voids along the fiber axis can be fabricated with a high accuracy.

Provided that the diameter  $d_p$  and the area fraction of the voids  $f_p$  of the preform 50 are measured before fiber drawing, the area fraction of the voids  $f_f$  in the optical fiber 10 can be obtained by the following equation from the outer diameter  $d_f$  of the optical fiber 10 measured by the measuring means 80, the supply speed  $V_a$  of the preform 50 measured by the supply means 71 and the fiber drawing speed  $V_b$  of the optical fiber 10 measured by the towing means 81.

$$f_f = f_p \times (d_p^2 V_a / d_f^2 V_b)$$

Based on the foregoing, it is respectfully submitted that claims 11-21 are fully described in the Applicants' specification, and that one of ordinary skill in the art would readily understand how to practice the claimed invention.

The Examiner states that it is unclear whether one can copy the Applicants' invention and avoid infringement merely by calculating the values rather than measuring them. Infringement is not an issue for the Examiner. The Examiner's sole inquiry is under the second paragraph of 35 U.S.C. § 112, **without considering the implications of covering a particular product or process.** *Neomagic Corp. v. Trident Microsystems, Inc.*, 287 F.3d 1062, 1074 (Fed. Cir. 2002); *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1197, 1118 (Fed. Cir. 1985).

The Office Action asserts that it is unclear if “voids” in line 8 of claim 11 refers back to the voids of line 4. All occurrences of “voids” in claim 11 have been amended to “plurality of voids.”

The Office Action asserts that it is unclear if the voids of claim 14 are the same voids of claim 11. Claim 14 has been amended to recite, “...boring three or more voids of the plurality of voids.” Support for amended claim 14 is found in, for example, Fig. 7; pg. 35, lines 7-19; pg. 46, lines 7-15.

The Office Action asserts that it is unclear whether one should interpret the claimed mediums to be directed to encompass the embodiments, which only have a single medium. As described in the subject matter of amended claim 16, the plurality of regions made of a sub medium has a refractive index that *differs* from that of a main medium. For example, silica glass can be used as the main medium and air can be used as the sub medium. Contrary to the Examiner’s assertion, the main medium and the sub medium are not limited to those materials (*see, e.g.*, pg. 34, lines 17-21). The instant specification provides explicit support for the use of different materials, such as, plastic or the like for the main medium (*see, e.g.*, pg. 34, lines 21-22). The instant specification on page 34, lines 22-25 states:

While various gases or liquid or solid bodies which have optical characteristics different from those of the main medium can be used as the sub medium.

The Examiner has opted for a narrow interpretation of the claimed method, apparently forgetting that claim interpretation must be **reasonable** and **consistent** with the written description of the specification, in the **context** of the disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) (en banc). Simply put the Examiner’s interpretation of the claimed invention is unreasonable, inconsistent with the written description

of the specification, and inconsistent with how one having ordinary skill in the art would have interpreted the claimed invention in the **context** of the present disclosure.

The Office Action states that there is confusing antecedent basis for “adjusting means” in claim 11; it is unclear if it is the same thing as the means for adjusting. Applicants respectfully submit that the rejection is moot in view of the amendment to claim 11, which deleted “a means to adjust” and “adjusting means” as identified by the Examiner.

The Office Action asserts that there is no antecedent basis for “the glass softening point” in claim 15. Claim 15 has been amended from “the glass softening point” to --a glass softening point--.

The Office Action asserts that there is no antecedent basis for “the heating condition” in claim 16. Claim 16 has been amended from “the heating condition” to --a heating condition--.

Withdrawal of the foregoing rejection is respectfully requested.

#### **Claim Rejection Under 35 U.S.C. § 102**

Claims 11-14 and 16-20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,444,133 (hereinafter Fajardo). Amended claim 11 recites, “...drawing the optical fiber from the preform, wherein the drawing step includes obtaining an area fraction of the plurality of voids in the drawn optical fiber, and performing feedback control of pressure in the plurality of voids based on the obtained area fraction.”

The Office Action asserts that Fajardo discloses the means to measure in step 110 of Fig. 1. The Office Action also asserts that Fajardo discloses the means to adjust pressure (col. 6, lines 30-35).

Turning to the cited reference, Fajardo discusses determining the desired void-filling fraction for the etched preform 12 by specific photonic band gap effects to be exhibited by the

resulting photonic band gap filter (*see, e.g.*, col. 4, lines 51-55). Fajardo describes increasing the dynamic pressure of the etching agent 18 so that the etching agent 18 may be circulated through the delivery circuit 22 (col. 6, lines 30-35). Fig. 1 of Fajardo shows the steps of determining the desired void filling fraction 110 and flowing etching agent through the preform until the preform has the desired void filling fraction 118 occurring before the step of making a photonic band gap fiber from the preform 124. Fajardo fails to disclose or suggest, at a minimum, "...drawing the optical fiber from the preform, wherein the drawing step *includes* obtaining an area fraction of the plurality of voids in the drawn optical fiber, and performing feedback control of pressure in the plurality of voids based on the obtained area fraction," as recited in amended claim 11.

Fajardo describes stabilizing the temperature of the etching agent 18 (col. 4, lines 56-60). Fajardo discusses that the length of time for circulating the etching agent 18 is determined before the drawing step (col. 8, lines 11-14). Fajardo states in col. 8, lines 11-14:

**the period of time that the etching agent 18 circulates through the preform 12 is determined by the pre-etch dimensions of the internal passageways 14 and the desired post-etching void-filling fraction of the preform (*emphasis added*).**

Fajardo *teaches away* from varying at least a temperature of the drawing furnace for heating the preform or a time length of the optical fiber to pass the drawing furnace. Both steps occur before the drawing step in Fajardo. Fajardo fails to disclose or suggest, at a minimum, "...the drawing step includes a heating condition that *varies* at least a temperature of a drawing furnace for heating said preform or a time length for the optical fiber to pass the drawing furnace," as recited in amended claim 16.

As anticipation under 35 U.S.C. § 102 requires that each and every element of the claim be disclosed, either expressly or inherently (noting that "inherency may not be established by probabilities or possibilities," *Scaltech Inc. v. Retec/Tetra*, 178 F.3d 1378 (Fed. Cir. 1999), in a



single prior art reference, *Akzo N.V. v. U.S. Int'l Trade Commission*, 808 F.2d 1471 (Fed. Cir. 1986), based on the foregoing, it is submitted that Fajardo does not anticipate claims 11-14 and 16-20 nor any claim dependent thereon.

Withdrawal of the foregoing rejection is respectfully requested.

### **Claim Rejection Under 35 U.S.C. § 103**

Claims 15 and 21 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Fajardo, and further in view of U.S. Patent No. 6,474,108 to Onishi et al. Claims 15 and 21 depend from claims 11 and 16, respectively, and include all of the features of their base claim plus additional features, which are not taught or suggested by the cited references. Therefore, for at least these reasons, it is respectfully submitted that claims 15 and 21 are also patentably distinguishable over the cited references.

### **New Claim**

New claim 25 recites, "...drawing the optical fiber from said preform, wherein the drawing step includes determining an area fraction of the plurality of voids in the drawn optical fiber, and performing a feedback control of a pressure in the plurality of voids based on the determined area fraction; and closing the plurality of voids by heating and fusing the optical fiber selectively at a plurality of portions spaced apart along the preform axis." Nothing in the cited references teaches or suggests the described subject matter. It is submitted that this new claim is distinguishable over the cited references.

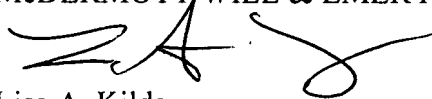
**Conclusion**

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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